

Nucleic Acids Research

Executive editors

R.T. Walker, *Birmingham, UK*
M.P. Deutscher, *Farmington, CT, USA*
J.E. Donelson, *Iowa City, IA, USA*
S.C.R. Elgin, *St. Louis, MO, USA*
R.J. Roberts, *Cold Spring Harbor, NY, USA*
S. Tilghman, *Princeton, NJ, USA*

Editorial board

A.J. Berk, *Los Angeles, CA, USA*
G. Bernardi, *Paris, France*
P. Borst, *Amsterdam, The Netherlands*
G.G. Brownlee, *Oxford, UK*
J.M. Calvo, *Ithaca, NY, USA*
C.R. Cantor, *New York, USA*
P. Chambon, *Strasbourg, France*
N. Chua, *New York, USA*
D.A. Clayton, *Stanford, CA, USA*
I.B. Dawid, *Bethesda, MD, USA*
P. Dervan, *Pasadena, CA, USA*
M.L. DePamphilis, *Nutley, NJ, USA*
F. Eckstein, *Göttingen, FRG*
M. Ehrlich, *New Orleans, LA, USA*
P.T. Englund, *Baltimore, MD, USA*
D. Gallwitz, *Göttingen, FRG*
W.T. Garrard, *Dallas, TX, USA*
R.F. Gesteland, *Salt Lake City, UT, USA*
N. Glansdorff, *Brussels, Belgium*
R.B. Hallick, *Tucson, AZ, USA*
C. Hélène, *Paris, France*
T. Honjo, *Kyoto, Japan*
M. Ikehara, *Osaka, Japan*

A.S. Jones, *Birmingham, UK*
L. Kisselev, *Moscow, USSR*
C.J. Leaver, *Edinburgh, UK*
T. Lindahl, *London, UK*
S.M. Linn, *Berkeley, CA, USA*
H.F. Lodish, *Cambridge, MA, USA*
W.R. McClure, *Pittsburgh, PA, USA*
R. McMacken, *Baltimore, MD, USA*
J.R. Nevins, *New York, USA*
S. Nishimura, *Tokyo, Japan*
W.J. Peacock, *Canberra, Australia*
L. Philipson, *Heidelberg, FRG*
R.J. Planta, *Amsterdam, The Netherlands*
T. Platt, *Rochester, NY, USA*
M. Revel, *Rehovot, Israel*
R.K. Robins, *Costa Mesa, CA, USA*
J.M. Rosen, *Houston, TX, USA*
C.W. Schmid, *Davis, CA, USA*
G. Schütz, *Heidelberg, FRG*
Y. Shimura, *Kyoto, Japan*
R. Simpson, *Bethesda, MD, USA*
D. Söll, *New Haven, CT, USA*
B. Sollner-Webb, *Baltimore, MD, USA*
E.M. Southern, *Oxford, UK*
S. Spadari, *Pavia, Italy*
R.H. Symons, *Adelaide, Australia*
J.H. van Boom, *Leiden, The Netherlands*
Y. Wang, *Shanghai, China*
A.M. Weiner, *New Haven, CT, USA*
R. Williamson, *London, UK*

Production editor

Jacqueline Boyers, *IRL Press*

 **IRL PRESS**
Oxford · Washington DC

Nucleic Acids Research (ISSN 0305-1048) is published semi-monthly for US \$650.00 per year in 1987 by IRL Press Ltd, PO Box 1, Eynsham, Oxford, UK. Second class postage paid at Jamaica, NY 11431, USA.
US Postmaster: send address changes to *Nucleic Acids Research*, Publications Expediting Inc., 200 Meacham Avenue, Elmont, LI NY 11003.

Subscriptions

An annual subscription to *Nucleic Acids Research* comprises 24 issues, with an Annual Author and Subject Index. Subscriptions are entered on a calendar year basis only.

Annual subscription rates (Volume 15, 1987).

All subscription rates include handling and delivery, by air beyond Europe.

The Americas	US \$650.00
Japan	Yen 180 000
Rest of the World	£350.00

Back volume prices and subscription rates for individuals are available on request.

Orders. Orders and payments from, or on behalf of, subscribers in the various geographical areas shown below should be sent to IRL Press Ltd or their nearest agent with payment made in the currency indicated.

The Americas. Payment in US dollars to IRL Press Inc., PO Box Q, McLean, VA 22101-0850, USA.

Japan. Payment in Yen to sole agents, USACO Corporation, Tsutsumi Building, 13-12 Shimbashi 1-chome, Minato-ku, Tokyo 105, Japan.

Rest of the World. Payment in sterling to the main office for subscriptions: IRL Press Ltd, PO Box 1, Eynsham, Oxford, OX8 1JJ, UK. Tel: (0865) 882283; telex: 83147 (IRL); fax: (0865) 882890.

Advertising. To advertise in *Nucleic Acids Research* contact IRL Press Inc. in the Americas or IRL Press Ltd in the rest of the world (see addresses above).

Authorization to photocopy items for internal or personal use, or the internal or personal use of specific clients, is granted by IRL Press Ltd for libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that the base fee of \$3.00 per copy is paid directly to CCC, 21 Congress St., Salem, MA 01970, USA. 0305-1048/87 \$3.00 + 0. Special requests, such as copying for general distribution, or for advertising or promotional purposes, should be addressed to the Production Editor, *Nucleic Acids Research*, IRL Press Ltd, PO Box 1, Eynsham, Oxford OX8 1JJ, UK.

© 1987 IRL Press Ltd. All rights reserved by the publisher.

Printed by Information Printing Ltd, Oxford, England.

Instructions to authors

Scope of the journal

Nucleic Acids Research provides rapid publication for papers on physical, chemical, biochemical and biological aspects of nucleic acids and their constituents.

Organization of the journal

The Contents Page lists papers under the headings: Surveys and Summaries, Molecular Biology, Enzymology, Chemistry, For The Record and RFLP Reports. Authors are asked to indicate the heading under which they would expect their paper to appear.

Papers (including figures and tables) must not exceed 20 pages in length. Restriction maps and nucleic acid sequences which have been determined by established methods should be presented in the briefest possible fashion. Data that support the conclusions are generally not published but must be available for the referees.

Criteria for acceptance

The journal can publish only a fraction of the manuscripts it receives. For this reason, the Editors insist that all manuscripts considered for publication meet the criteria of originality, timeliness, significance and scientific excellence. Because technical progress in the isolation and sequence analysis of both RNA and DNA has greatly increased the amount of new sequence information, the Editors favour those manuscripts in which new sequences are accompanied by complementary data bearing on genomic organization, transcription, RNA processing, expression and genetic analysis. *Nucleic Acids Research* cannot serve as a mere repository for nucleic acid sequence information; the reported sequence must shed significant new light on basic questions of structural or functional interest. Sequences of cDNAs or genes whose gene products are not relevant to nucleic acids are not acceptable as full length papers. The Editors encourage those sequence manuscripts in which the gene product interacts with nucleic acids, as well as those in which information of special interest to the nucleic acid field emerges: e.g., those dealing with gene regulation or unusual gene organization. They also consider for inclusion manuscripts dealing with comparative sequence analyses if the genes under study are of relevance to nucleic acid metabolism. Sequences of genes for well studied RNAs (as well as the RNA sequences themselves) are not acceptable unless of unusual interest. However, all sequence papers are considered for publication in the 'For The Record' format. 'Methods papers' are considered only if an outstanding and potentially very useful advance is clearly documented. Otherwise, we prefer that such information be included in the Methods section of a paper presenting new data of interest. Except in extraordinary cases, manuscripts presenting construction of cloning vehicles or clone banks, preparation of monoclonal antibodies, identification of isoschizomer restriction enzymes

or those describing routine synthesis of oligonucleotides are not published.

Chromosome assignment papers where only cytological data are presented are not acceptable. Likewise, simple NMR assignment papers are not acceptable. Only those which present new information not previously available from other methods are considered. Manuscripts dealing with small molecule-nucleic acid interactions are considered only if they present substantial new information relevant to nucleic acid structure. Clones, strains or programs described in *Nucleic Acids Research* should be made available. Papers dealing with computer analysis of already published sequences are acceptable only if new and interesting findings emerge.

Surveys and Summaries

These are intended to provide a format for brief reviews which collect information not previously available in a single article.

For The Record

In some cases, manuscripts not suitable for inclusion as regular papers may be considered in this section. See detailed instructions in Volume 15 number 1, January 12, 1987.

Restriction Fragment Length Polymorphisms (RFLPs)

See detailed instructions in Volume 15 number 1, January 12, 1987.

Submission of manuscripts

Submission of a paper implies that it reports unpublished work and that it is not under consideration for publication elsewhere. If previously published tables, illustrations or more than 200 words of text are to be included then the copyright holder's permission must be obtained. Copies of any such permission letters should be enclosed with the paper.

Three copies of the manuscript (one original and two photocopies) including three original sets of figures should be submitted as follows:

From the Americas (except all organic chemistry papers to Birmingham) to:

The Editor, *Nucleic Acids Research*, IRL Press Inc., PO Box Q, McLean, VA 22101, USA.
Tel: 703 437 3334.

From the Rest of the World (except all computer papers to McLean) to:

Dr R.T. Walker, Department of Chemistry, University of Birmingham, PO Box 363, Birmingham B15 2TT, UK.
Tel: 021 476 1688.

All computer manuscripts should be sent to:

The Editor, *Nucleic Acids Research*, IRL Press Inc, PO Box Q, McLean, VA 22101, USA.

All manuscripts on chromatin structure should be submitted directly to:

Dr S.C.R. Elgin, Department of Biology, Washington University, Campus Box 1137, St. Louis, MO 63130, USA.

If a manuscript is rejected, normally only the original copy, together with all the figures, are returned to the author.

Preparation of manuscripts

Typewritten manuscripts are directly reproduced by photo-offset printing, after reduction to three-quarters of the original size.

Authors are urged to use specially ruled typing sheets which are available on request from the publisher.

The title, authors and addresses should be typed on a separate sheet of paper. These details are typeset by the publisher to a standard format.

The text should be submitted typed unjustified to a maximum width of 165 mm (6½ in), a minimum width of 160 mm (6¼ in) and a depth of 240 mm (9½ in).

Figures and legends should be submitted separately from the text to be inserted in position by the publisher. No spaces for figures should be left in the text.

Line spacing. Type all the main text at one-and-a-half line spacing (the number of lines expected on a page is 36–38) or, *provided that the text does not contain many subscripts and superscripts, at single line spacing.* Type the abstract, figure legends and references at single line spacing. The first page of the manuscript should begin with the abstract (single line spacing), which should not exceed 15 lines in length. Then start the main text filling page 1 to a depth of 180 mm (7½ in). Do not insert any extra space between paragraphs, but do leave an extra one-and-a-half-line space before all first order headings. Any corrected sections of text must not be superimposed using any form of transparent tape. Each page should be numbered at the bottom in light blue pencil.

Headings. Type first-order (section) headings in CAPITALS, underline, do not indent, and continue text on next line. Type second-order headings in upper and lower case, underline, do not indent, and continue text on next line. Type third-order headings in upper and lower case, underline, and continue text on the same line.

Tables and figures. Tables should be numbered consecutively and should include a short descriptive title. When explanatory footnotes are included they should be typed at single-line spacing and the table, together with its footnotes, should not exceed the normal page dimensions. Figures are reduced to three-quarters of their original size or less; both symbols and letters must be legible after this reduction. Line drawings should preferably be submitted as photographic prints. All lines must be black: grey will not reproduce. Photographs should be high quality glossy prints. A charge is made for publication of a colour plate. The maximum size for all figures is 165 mm (6½ in) wide and 240 mm (9½ in) deep. Figures must be identified on the back by the figure number and the name of the author and the top clearly indicated.

Legends to figures, typed at single line spacing, should be brief. All lines of the figure legend must be typed to 165 mm (except, where appropriate, legends may be typed to fit at the side of figures). Manuscripts containing detailed photographs should be printed on smooth-coated paper to improve the quality of reproduction. Authors may request this service at the time of submission of the manuscript, or the Editors may advise it at the time of acknowledgement. In either case a charge of \$50 (£28) will be made.

Footnotes should be avoided.

Acknowledgements should be placed at the end of the text and before the References.

References should be numbered in order of appearance in the text and must not be listed in alphabetical order. The citation of journals (abbreviated in the style of *Chemical Abstracts*), books and multi-author books should conform with the following examples. Single-line spacing should be used throughout, including between individual references.

1. Razzell, W.E. and Khorana, H.G. (1958) *Biochim. Biophys. Acta* **28**, 562–566.
2. Davidson, J.N. (1969) *The Biochemistry of the Nucleic Acids*, 6th edn, pp. 177–178. Methuen, London.
3. Burdon, R.H. (1971) In Davidson, I.N. and Cohn, W.E. (eds), *Progress in Nucleic Acids Research and Molecular Biology*, Academic Press, New York, Vol. II, pp. 33–79.

References of the type Smith *et al.* (1979) must not be included. Personal communications should be authorized by those involved in writing.

Reprints

The publishers supply 30 reprints free of charge. A Reprint Order Form will accompany notification of acceptance of a manuscript and should be completed and returned to the publisher immediately as late orders, submitted after the journal is printed, are subject to a 50% surcharge to cover the additional printing costs.

1987 dollar price

No. of copies ordered	Size of article in no. of pages		
	1–8	9–16	17–20
100	\$ 79.00	158.00	234.00
200	139.00	277.00	419.00
300	194.00	388.00	585.00
400	240.00	480.00	720.00
additional lots of 100	42.00	89.00	128.00

For price in £ sterling divide by 1.8.

Author index

- Adami, G.R. 2593
Appel, B. 2463
Arnold, J. 2611, 2627
Barrett, P. 2719
Bettany, A.J.E. 2417
Blattner, F.R. 2677
Böck, A. 2431
Brown, A.J.P. 2417
Carbon, P. 2463
Carlberg, C. 2779
Carmichael, G.G. 2593
Chambon, P. 2445
Ciliberto, G. 2403
Clark, L. 2719
Couderc, J.L. 2549
Covarrubias, A.A. 2757
Crabtree, G.R. 2774
Daillie, J. 2707
Dastugue, B. 2549
Davies, K.E. 2639
De Baere, R. 2773
de Stevenson, I.L. 2737
de Turenne Tessier, M. 2707
De Wachter, R. 2773
Dean, D.A. 2515
Decaussin, G. 2707
den Dunnen, J.T. 2772
Deng, Z. 2665
Dudley, J.P. 2581
Dunn, I.S. 2677
Durdik, J. 2699
Ebel, J.-P. 2463
Ehrlich, R. 2780
Ernoul-Lange, M. 2445
Faulk, K. 2639
Gaillard, J. 2781
Hahn, U. 2779
Hamerton, J.L. 2784
Hay, R.T. 2719
Hendriks, L. 2773
Hilal, L. 2549
Hiraoka, N. 2653
Hobbs, H.H. 2782
Holbrook, N.J. 2774
Holm, T. 2537
Hopwood, D.A. 2665
Hummel, H. 2431
Ishizaki, Y. 2653
Ivarie, R. 2611, 2627
Julier, C. 2537
Kay, R. 2778
Kenwick, S. 2639
Kieser, T. 2665
Kofler, R. 2771
Koike, S. 2499
Kölling, R. 2479
Kotani, H. 2653
Kroemer, G. 2771
Krol, A. 2463
Kücherer, C. 2479
Leitersdorf, E. 2782
Leppert, M. 2537
Litt, M. 2783
Litt, R. 2783
Lothar, H. 2479
Mattaj, I.W. 2403
Mattei, J.-F. 2639
Mattei, M.G. 2639
May, E. 2445
McPherson, J. 2778
Messer, W. 2479
Miranda-Ríos, J. 2757
Moore, M.W. 2699
Morgan, J.G. 2774
Morris, D.R. 2563
Mounier, N. 2781
Mueller, O.T. 2783
Muramatsu, M. 2499
Nakamura, Y. 2537
Nohno, T. 2777
O'Connell, P. 2537
Obayashi, A. 2653
Omili, F. 2445
Ooka, T. 2707
Palla, F. 2403
Parent, L.J. 2780
Patterson, M. 2639
Philipson, L. 2403
Phillips, G.J. 2611, 2627
Prudhomme, J.-C. 2781
Purvis, I.J. 2417
Quaas, R. 2779
Riddell, D.C. 2784
Rogers, J.C. 2515
Romaniuk, P.J. 2737
Saito, T. 2777
Sakai, M. 2499
Sánchez-Pescador, R. 2757
Santiago, T.C. 2417
Schauzu, M.-A. 2479
Schoenmakers, J.G.G. 2772
Selsing, E. 2699
Shows, T.B. 2783
Siminovich, K.A. 2699
Singer, D.S. 2780
Sobrier, M.L. 2549
Srivenugopal, K.S. 2563
Starr, T. 2784
Strohal, R. 2771
Tebb, G. 2403
Thibodeau, S. 2639
Urdea, M. 2757
Vandenberghe, A. 2773
Wemmer, D.E. 2563
White, R. 2537
Whittier, R.F. 2515
Wick, G. 2771
Wittig, B. 2779
Wolff, R. 2537
Wong, H.-H.A. 2737
Wood, S. 2784
Zenke, M. 2445
Zhang, C.X. 2707